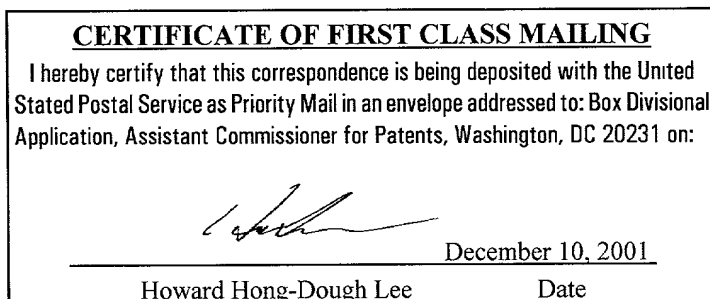


OFFICIAL



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Howard Hong-Dough Lee
Serial No.: 09/293,089
Filed: April 16, 1999
Title: ENERGY-CONSERVING COMPUTER ACCESSIBLE REMOTELY AND INSTANTANEOUSLY
Examiner: Sumati Lefkowitz
Art Unit: 2181

PRELIMINARY AMENDMENT FOR DIVISIONAL APPLICATION under 37 CFR 1.53(b)

Commissioner of Patents and Trademarks
Washington, D.C. 20231

In response to the Office Action dated October 1, 2001, Applicant respectfully elect Group V restriction, i.e., claims 48-53 defined by the Primary Examiner as a first divisional filing for the above-identified United States parent patent application by providing the preliminary amendment as follows:

Kindly delete the Title of the parent application in its entirety, and substitute therefor the new Title to reflect the election of Group V restriction as the current divisional filing, accordingly.

Kindly delete page 1 of the parent application in its entirety, and substitute therefor the separate abstract page attached in the page 2 of the current divisional filing.

Kindly cancel claims 1-47 of the parent application, amend claims 48-53 and add claims 54-63, resulting in sixteen claims in total for the current divisional filing as follows. A version of the amended claims, marked up to show all changes, is contained on a separate page attached hereto as Appendix A.

In the Title

ENERGY-CONSERVING MICROPROCESSOR OR CPU SYSTEM AND METHOD OF THE SAME BY PROVIDING KEEP-ALIVE MICROPROCESSING

Abstract

An energy-conserving microprocessor or CPU system comprises keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive or auxiliary power, and main circuitry operable for performing main information processing only when receiving main power. The keep-alive circuitry renders a CD/DVD player, a hard-disk drive, and/or a network card operable while allowing the main power to be absent. The main circuitry is actuated only when high-computation-power is needed, for instance, at the beginning of booting, or when loading a complex software program or performing complicate computation. In contrast, conventional microprocessors and computers have being designed to be either operable only at full power or inoperable once entered the traditional sleep or standby state. Thus, the energy-conserving microprocessor or CPU system or the energy-conserving method of the same not only renders a computer instantly accessible but eliminates any unnecessary energy waste and annoying noise especially during operations, for the first time.

In the Claims

Kindly cancel claims 1-47.

Kindly amend claims 48-53 and add claims 54-63 as follows.

48. (Amended) An energy-conserving microprocessor or CPU system comprising:
- (a) keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive power; and
 - (b) main circuitry operable for performing main information processing only when receiving main power.

49. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is adapted to be also operable when said main power is present.

50. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is provided for controlling an activity of associated device means when said main power is absent.

51. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is provided for performing a keep-alive task when said main power is absent, said keep-alive task including to actuate said main circuitry when needed.

52. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external means so as to request said keep-alive circuitry to perform a requested activity selectively when said keep-alive power or said main power is present.

53. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said main circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external means so as to request said main circuitry to perform a requested activity when said main power is present.

54. (New) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is adapted to be de-actuatable in response to a request signal.

55. (New) The energy-conserving microprocessor or CPU system of claim 48 further comprising means operable for cooling said main circuitry only when said main power is present.

56. (New) An energy-conserving method for a microprocessor or CPU system comprising:
- (a) providing auxiliary information processing when receiving auxiliary power; and
 - (b) actuating main information processing only when receiving main power.

57. (New) The energy-conserving method for a microprocessor or CPU system of claim 56, wherein said providing auxiliary information processing is also provided when said main power is present.

58. (New) The energy-conserving method for a microprocessor or CPU system of claim 56, wherein said providing auxiliary information processing is provided for controlling an activity of associated device means when said main power is absent.

59. (New) The energy-conserving method for a microprocessor or CPU system of claim 56, wherein said providing auxiliary information method is provided for performing a keep-alive task including to actuate said actuating main information processing when needed.

60. (New) The energy-conserving method for a microprocessor or CPU system of claim 56, wherein said providing auxiliary information processing is provided in response to a request signal selectively when said auxiliary power or said main power is present.

61. (New) The energy-conserving method for a microprocessor or CPU system of claim 56, wherein said actuating main information processing is provided in response to a request signal.

62. (New) The energy-conserving method for a microprocessor or CPU system of claim 56 further comprising a step of de-actuating said providing auxiliary information processing in response to a request signal.

63. (New) The energy-conserving method for a microprocessor or CPU system of claim 56 further comprising a step of actuating cooling only when said actuating main information processing is actuated.

REMARKS

In the Office Action dated on October 1, 2001, the Primary Examiner reviewed claims 1-53 of the U.S. Patent Application No. 09/293,089, with the result that claims 1-36 are allowed after election, for which Applicant is sincerely grateful, and claims 37-53 are deemed to draw four restrictions under 35 U.S.C. 121.

In response, Applicant have elected and amended claims 48-53 and add claim 54-63 all under Group V restriction as defined by the Primary Examiner. Claims 54 and 55 recite Applicant's energy-conserving microprocessor or CPU system with specific functions of respectively de-actuating the keep-alive circuitry and of cooling, which are embodied in the context of Applicant's specification and FIGS. 2-6 (especially FIG. 5). Claims 56-63 are similar to claims 48-55 except for being in a method format. No new matter is presented in the above amendments for the divisional filing. Favorable consideration and allowance of the claims are respectfully requested as Applicant have followed the Primary Examiner's guidance on restrictions in view of the above amendments and the following remarks.

As elaborated in Applicant's SUPPLEMENT TO PRELIMINARY AMENDMENT respectfully faxed on September 28, 2001, Applicant recite the energy-conserving microprocessor or CPU system comprising keep-alive circuitry for performing keep-alive or auxiliary information processing when receiving keep-alive or auxiliary power, so as to allow a computer to perform simple logical or decoding operations such as playing an audio CD or a DVD, or writing information down-loaded from the Internet to a hard-disk drive, without requiring the use of main (or high-computation-power) circuitry, for the first time.

In contrast, conventional wisdom keeps pushing a higher speed for a microprocessor or CPU, which requires to consume and thus waste more energy inevitably once remaining in operations. Another dilemma of the conventional practice is that the existing computers have being designed to be either operable only in a normal operating state, or inoperable in a standby state, suspend state and shutdown state. In other words, there is no energy-conserving operating state in between. As a result, in the normal operating state, a conventional microprocessor always consumes maximal and mostly unnecessary energy in order to remain operable or even ready (i.e., waiting) for performing information processing, which then requires heat dissipation consistently and further incurs energy waste as well as unpleasant or annoying noise. The more powerful is the CPU, the worse will be on the issues on heat dissipation, energy waste and annoying noise. On the other hand, once entered the conventional standby state or the shutdown state, the conventional microprocessor becomes essentially inoperable.

It is believed that Applicant perceive and solve the unsuggested, unrecognized, and unsolvable

Serial Number: 09/293,089

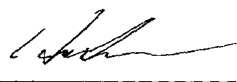
problem in energy waste and annoying noise during information processing, for the first time.

Furthermore, Applicant's energy-conserving microprocessor (or CPU) system or the method of the same solves the prior inoperability of a conventional computer when entered into the traditional sleep or standby state, for the first time. After all, the operation of a computer is mostly bounded by our human limitations in typing and reading. A conventional keyboard is restricted to generate 30 key inputs per second at best, i.e., 30 Hz only. Thus, a microprocessor and its host computer is often idled waiting for a user's input or operated mostly at speed much, much lower than any known slowest computer.

Accordingly, by providing a low-computation-power state or reduced-clocking speed, Applicant's divisional filing not only renders a computer instantly accessible but eliminates any unnecessary energy waste and annoying noise during operations, for the first time. Neither of these distinct features is taught by any reference of record. Nor of any conventional microprocessor or CPU can be remained operable for performing information processing once its host computer enters the standby or sleep state.

In view of the above, it is believed that Applicant's claims define patentable novelty and uniqueness over all the references of record. It is therefore respectfully requested that this divisional application be given favorable consideration. Should the Examiner have any questions with respect to any matter now of record, Applicant may be reached at (248) 737-0133.

Respectfully submitted,

By 
Howard Hong-Dough Lee

Date: December 10, 2001
Tel.: (248) 737-0133
Fax: (248) 737-2567
E-mail: ist_HL@yahoo.com

Attachments: Appendix A

VERSION WITH MARKINGS TO SHOW CHANGES MADE¹

In the Claims:

Claims 48-53 have been amended as follows:

48. (Amended) An energy-conserving microprocessor or CPU system comprising:
- (a) keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive power; and
 - (b) main circuitry operable for performing main information processing only when receiving main power.

49. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is adapted to be also operable when said main power is present.

50. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is provided for controlling an activity of associated device means when said main power is absent.

51. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is provided for performing a keep-alive task when said main power is absent, said keep-alive task including to actuate said main circuitry when needed.

52. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said keep-alive circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external [manual-operable] means so as to request said keep-alive circuitry to perform a requested activity selectively when said keep-alive power or said main power is present.

53. (Amended) The energy-conserving microprocessor or CPU system of claim 48, wherein said main circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external [manual-operable] means so as to request said main circuitry to perform a requested activity when said main power is present.

¹ Brackets “[]” indicate deletions and underlining “ ” indicates insertions.

OFFICIAL

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted
to the Patent and Trademark Office on the date shown below:



September 28, 2001

Howard Hong-Dough Lee

Date

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Howard Hong-Dough Lee
Serial No.: 09/293,089
Filed: April 16, 1999
Title: ENERGY-CONSERVING COMPUTER ACCESSIBLE REMOTELY AND
INSTANTANEOUSLY
Examiner: Lefkowitz
Art Unit: 2786

SUPPLEMENT TO PRELIMINARY AMENDMENT FILED ON OCTOBER 16, 1999

Commissioner of Patents and Trademarks
Washington, D.C. 20231

In response to the three references (US Pat. Nos. 5,579,524, 5,848,281, and 5,742,514) cited and faxed (to Applicant) from Examiner on September 25, 2001, Applicant, after carefully reviewing the prior art, respectfully submits the corresponding remarks and proposed amendments hereinbelow as follows:

In the Claims

Please rewrite claims 48 as follows. A version of the rewritten claims, marked up to show all changes relative to the previous version of the claims, is contained on a separate page attached hereto as Appendix A.

48. (Amended) An energy-conserving microprocessor or CPU comprising:
- (a) keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive power; and
 - (b) main circuitry operable for performing main information processing only when receiving main power.

REMARKS

In a recent phone communication with Applicant on September 25, 2001, Examiner reviewed claims 48-53 of the above-identified U.S. Patent Application, with the result that claims 48-53 are allowed to group into the first elected set of claims 1-36 which have been deemed allowable in a previous phone communication. However, Examiner cited three references (US Pat. Nos. 5,579,524, 5,848,281, and 5,742,514) deemed to affect the allowability of claims 48-53.

In response, Applicant has amended the independent claim 46 as set forth above to recite the energy-conserving microprocessor or CPU as being the central processing unit that controls the operating function or information processing (in general) of a computer, such as performing arithmetic and logical operations and decoding/executing instructions as known in the art, instead of a power supply or management system. More importantly, Applicant's energy-conserving microprocessor is totally different from the conventional microprocessor or CPU.

In terms of information processing, a conventional computer is designed to be operable in a normal operating state, or inoperable in a standby state, a suspend state and a shutdown state. As a result, in the normal operating state, a conventional microprocessor has to consume maximum energy in order to remain operable for performing information processing, thus requiring consistent heat dissipation that further incurs energy waste and unpleasant or annoying noise. The more powerful is the CPU, the more concern will be on heat dissipation and energy waste as well as annoying noise. When entering the conventional standby state or the shutdown state, the conventional microprocessor becomes essentially inoperable as known in the conventional practice.

In contrast, Applicant's independent claim 48 recites the energy-conserving microprocessor as comprising (a) keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive power, and (b) main circuitry operable for performing main information processing only when receiving main power. Applicant's claim 50 clearly defines the keep-alive circuitry as being provided for controlling an activity of associated device means (for example, a CD/DVD player, a hard-disk drive, and/or a network card) when the main power is absent. This is particular useful in energy conservation and noise elimination because a computer does not consistently require its high-computation power for playing a music CD or for recording information being slowly down-loaded, at all. Applicant's claim 51 also defines the energy-conserving microprocessor or CPU as comprising the keep-alive circuitry for performing a keep-alive task (such as playing a music CD or DVD or down-loading information from the Internet) when the main power is absent, i.e., without requiring the presence of the main power. Applicant's claim 52 further defines the energy-conserving microprocessor

or CPU as comprising keep-alive circuitry adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external manual-operable means so as to request the keep-alive circuitry to perform a requested activity selectively when the keep-alive power or the main power is present. In other words, Applicant's claim 52 teaches that the microprocessor or CPU of a computer can be manually activated to operate an energy-conserving operating function for performing auxiliary information processing (so as to eliminate any unnecessary energy waste and annoying noise), when entering a keep-alive state or energy-conserving operating state. In general, Applicant's claim 48-53 teach an energy-conserving microprocessor or CPU comprising auxiliary (or low-computation-power) circuitry for performing simple logical or decoding operations such as playing an audio CD or a DVD, or reading/writing information without requiring the use of main (or high-computation-power) circuitry. The main circuitry is activated only when high-computation-power is needed such as at the beginning of booting, loading a complex software program, or performing complicate computation. Neither of these is taught by any reference of record.

Thus, Applicant's claims 48-53 are now clearly distinguished and totally different from the power supply or power management apparatuses disclosed by Kikinis, Smalley et al., and Bonola.

Applicant believes that the above amendment does not present new matter. Favorable reconsideration and allowance of claims 48-53 are respectfully requested in view of the above amendment and the following remarks.

As per Kikinis, shown is an optimized power supply system for computer equipment. Kikinis teaches a power supply system has plural power supplies for powering selected groups of components.

As per Smalley et al., shown is an apparatus for providing power management function in a multifunction controller having an embedded microprocessor, rather than the microprocessor itself.

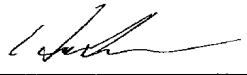
As per Bonola, shown is a computer system having a power supply that includes switched and unswitched power modes for supplying appropriate DC voltages.

Neither Kikinis, Smalley et al., nor Bonola teaches an energy-conserving microprocessor or CPU capable of performing auxiliary information processing when receiving keep-alive power (or auxiliary power) and main information processing only when receiving main power, as recited in Applicant's claims 48-53. Thus, Applicant's energy-conserving microprocessor or CPU recited in the amended independent claim 48 is totally different from the power supply or the power management systems taught by Kikinis, Smalley et al., and Bonola, and not anticipated by any reference of record.

Serial Number: 09/293,089

In view of the above, it is believed that Applicant's claims 48-53 define patentable novelty and uniqueness over all the references of record. It is therefore respectfully requested that Applicant's claims 48-53 be also given favorable consideration. Should the Examiner deem further search necessary, Applicant will accept the claims 48-53 as a fifth restriction and file a separate divisional application so that a Notice of Allowance for the claims 1-36 (as indicated in the previous phone message) would be sent in due course.

Respectfully submitted,

By 
Howard Hong-Dough Lee

September 28, 2001
Howard Hong-Dough Lee
Sole inventor
Tel.: (248) 737-0133
Fax: (248) 737-2567

Attachments: Appendix A

VERSION WITH MARKINGS TO SHOW CHANGES MADE¹

In the Claims:

Claim 48 has been amended as follows:

48. (Amended) An energy-conserving microprocessor or CPU comprising:
- (a) keep-alive circuitry operable for performing auxiliary information processing when receiving keep-alive power; and
 - (b) main circuitry operable for performing main information processing only when receiving main power.

¹ Brackets “[]” indicate deletions and underlining “ ” indicates insertions.

PATENT

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October 16, 1999



Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor: Howard Hong-Dough Lee
Serial No.: 09/293,089
Filed: April 16, 1999
Title: ENERGY-CONSERVING COMPUTER ACCESSIBLE REMOTELY AND INSTANTANEOUSLY
Examiner:
Art Unit: 2786

PRELIMINARY AMENDMENT BEFORE OFFICIAL ACTION

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Please preliminarily amend the patent application of U.S. Serial No. 09/293,089 filed on April 16, 1999, as follows:

In the Claims

Kindly add new claims 48-53 as follows:

48. (New) An energy-conserving microprocessor or CPU comprising:
- (a) keep-alive circuitry operable when receiving keep-alive power; and
 - (b) main circuitry operable only when receiving main power.
49. (New) The energy-conserving microprocessor or CPU of claim 48, wherein said keep-alive circuitry is adapted to be also operable when said main power is present.
50. (New) The energy-conserving microprocessor or CPU of claim 48, wherein said keep-alive circuitry is provided for controlling an activity of associated device means when said main power is absent.
51. (New) The energy-conserving microprocessor or CPU of claim 48, wherein said keep-alive circuitry is provided for performing a keep-alive task when said main power is absent.

52. (New) The energy-conserving microprocessor or CPU of claim 48, wherein said keep-alive circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external manual-operable means so as to request said keep-alive circuitry to perform a requested activity selectively when said keep-alive power or said main power is present.


53. (New) The energy-conserving microprocessor or CPU of claim 48, wherein said main circuitry is adapted to establish circuit communication with an interfacing means provided for transmitting a signal issued from an external manual-operable means so as to request said main circuitry to perform a requested activity when said main power is present.

REMARKS

By this preliminary amendment before official action, applicant has added new claims 48-53 related to the energy-conserving microprocessor or central processor unit (CPU) that is also embodied in the context of Applicant's specification, for instance at page 7 lines 28-31, page 8 lines 8-15, page 9 lines 8-33, page 10 lines 3-8 and 18-23, page 12 lines 3-4 and 28-33, page 13 lines 6-8 and 19-23, page 15 lines 3-8, page 15 lines 9-16, page 17 claim 8, page 18 claims 14 and 15, and page 21 claims 31 and 36.

No new matter has been presented by the above preliminary amendment before official action. Should the Examiner have any questions with respect to any matter of the divisional application, Applicant may be reached at (248) 737-0133 by phone.

Very Respectfully submitted,

By 
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October 16, 1999
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